

the pendulum may be made to ascend or descend with a given acceleration; in the former case the time of swing is decreased, in the latter increased, and the two times are determined from the strip records of the upward and downward motions. In the example given by the author the agreement between the observed and calculated ratio of the times of swing is within one part in one thousand.

THE *Journal de Physique* for March contains a description of the apparatus for radio-active measurements by the electroscope method exhibited by Messrs. C. Cheneveau and A. Laborde at a recent meeting of the Société française de Physique. The electroscope is of the type introduced by the late Prof. P. Curie, the leaf of aluminium being supported by a plate rising from the base of the instrument, where it is insulated by passing through a plug of "ambroid." To its lower end a short or a long rod may be attached. Radio-active solids are placed in a shallow cylinder under the electroscope into which a short rod connected with the leaf projects. Gases are tested in a longer cylinder, into which a long rod projects. The aluminium leaf is observed through a microscope with a scale in the eye-piece, one division of which corresponds to 0.4 volt. The normal rate of leak of the instrument is 1 volt in twelve minutes, and the minimum for a measurement 1 volt a minute. The lowest rate of production of radium emanation measurable with the larger cylinder is 0.002 milligram per minute. The authors hope that the simplicity of the apparatus will lead to its extensive use.

MESSRS. J. W. GRAY AND SON, the well-known lightning-conductor experts, of 91 Leadenhall Street, have sent us a pamphlet, from the pen of their senior partner, Mr. Alfred Hands, entitled "Lightning and the Churches." The author estimates that not more than 25 per cent. or 30 per cent. of the ecclesiastical buildings in this country are provided with lightning conductors. Statistics which he has collected show that about twenty-four such buildings are damaged every year by lightning, and that of these about three are fitted with conductors which have failed to afford protection. Failure, he considers, may be due to original faults of construction or arrangement, to decay of important parts, or to alterations made in some of the metallic portions of the building after the conductor had been fixed. It is urged that the system of protection should be designed by an expert to suit each particular case, and should be inspected and tested at least once in every three years. The book contains many interesting photographs illustrating the destructive effects of lightning, and concludes with a list of 244 cathedrals, churches, and chapels which have been damaged by lightning during the last ten years.

THE principal features of the *Bulletin de la Classe des Sciences* (1908, No. 12) of the Royal Academy of Belgium are a paper by P. Bruylants on the derivatives of trimethylene and a paper by J. Fraipont on the okapi and its affinities with living and with extinct giraffes. The former paper, extending over eighty-four pages, contains a description of a wide range of compounds containing the

group $\begin{array}{c} \text{CH}_3 \\ | \\ \text{CH}_2 \end{array} \text{CHX}$, the boiling points and densities of

which are contrasted with those of the isomeric allyl compounds $\text{CH}_2=\text{CH}.\text{CH}_2\text{X}$, and of the isopropyl compounds $\begin{array}{c} \text{CH}_3 \\ | \\ \text{CH}_3 \end{array} \text{CHX}$; the trimethylene compounds usually have a higher boiling point and a higher density than the corresponding allyl and propyl compounds. The latter paper is

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illustrated by an excellent picture in colours of the *Okapia johnstoni*, a map showing its distribution in the Congo basin, and a series of six comparative photographs of the skull of the okapi and related species.

ATTENTION has been directed in these columns to observations by Noyes which indicated that the mobility of the hydrogen ion in hydrochloric and in nitric acids continued to decrease at dilutions considerably greater than those at which other ions exhibit constant mobilities. A recent paper by Chittock in the Proceedings of the Cambridge Philosophical Society records a number of observations in which the same experimental result was obtained, namely, an increase in the migration value of hydrogen in hydrogen chloride from the normal value 0.167 to 0.275 in very dilute solutions. The explanation given is, however, of a much simpler character, the suggestion being made that the decreased mobility of the hydrogen ion is due to its association with traces of ammonia present as impurities in the water, whereby the hydrochloric acid is converted into ammonium chloride. A similar conclusion had already been reached by Whetham and Paine from observations of the conductivity and migration velocities of dilute solutions of sulphuric acid. It should not be difficult, e.g. by distilling from phosphoric acid, to prepare water practically free from ammonia and basic impurities, and it would be of interest to know whether such samples of water would give rise to abnormalities similar to those described above.

MESSRS. WITHERBY AND CO. have in preparation a work on the "Birds of Kent," by Dr. Norman F. Ticehurst, who has for many years been well known among ornithologists as a close observer of the avifauna of the county. The work will be published by subscription, and only a limited edition will be issued.

A SPECIAL meeting of the council of the Iron and Steel Institute was held on Tuesday, April 20, under the presidency of Sir Hugh Bell, Bart., to consider the situation created by the resignation of the president-elect, Sir W. Thomas Lewis, Bart. A resolution of regret that Sir W. Thomas Lewis had found himself unavoidably precluded from assuming the office to which he had been elected was passed, and at the unanimous desire of those present Sir Hugh Bell consented to retain the presidency for a further term of twelve months. In that capacity he will, therefore, take the chair at the annual meeting and at the dinner on May 13 and 14 respectively.

OUR ASTRONOMICAL COLUMN.

HALLEY'S COMET.—*Science Progress* for the current quarter (No. 12, April, p. 543) contains an interesting article by Mr. Crommelin, who reviews the past history of Halley's comet and discusses the probable time of the approaching perihelion passage. In the retrospect Mr. Crommelin directs attention to the fact that a fifteen-months' variation of the period caused Halley to hesitate before accepting the conclusions regarding the object's periodicity; it is now known that the planetary perturbations may cause a five-year variation, from seventy-four to seventy-nine years.

The identifications of returns are now carried back so far as 240 B.C., although there is no certain identification of Halley's with any observed comet until 12 B.C.; its appearance at that return is very fully described in the Chinese annals. Mr. Crommelin regards it as certain that the comet will be re-discovered as soon as the region of Orion, where it now is, becomes observable in the autumn of the present year. January or February, 1910, should find it visible in small telescopes, or even to the naked eye.

As showing the enormous difference between the aphelion and perihelion velocities, Mr. Crommelin points out that nearly half the period, from December, 1856, to April, 1889, was spent on the small arc of the path which lies beyond the orbit of Neptune. At perihelion the similar arc will be traversed in two years. On the assumption that perihelion will occur on April 16, 1910, the comet should appear at its brightest for a few days after May 17, its distance from the earth being then only about 12,000,000 miles.

PRESSURE IN THE SUN'S ATMOSPHERE.—*Apropos* of the discussion as to the pressure obtaining in sun-spots, the results published by MM. Fabry and Buisson in No. 11 of the *Comptes rendus* of the Paris Academy of Sciences are of special interest. Using their interference method, they have investigated a number of the displacements of solar lines which may be due to pressure. They find that all the lines do not behave alike; some are displaced in one direction by different amounts, whilst others are displaced in the opposite direction. Such displacements may not be attributed wholly to pressure, but are allied to the asymmetrical broadening of lines in the arc investigated by Dr. Duffield.

For the solar work MM. Fabry and Buisson selected fine lines such as are symmetrically broadened, and for twenty lines between $\lambda\lambda$ 4000 and 4500 they find a displacement corresponding to a pressure of four or five atmospheres above atmospheric pressure. Twelve lines between $\lambda\lambda$ 5100 and 5500 gave a similar result, and it therefore appears that a pressure of 5 or 6 atmospheres obtains where the iron absorption takes place in the sun's atmosphere.

THE SPECTRA OF NEBULÆ.—In these columns on March 11 (*NATURE*, No. 2053, p. 19) we briefly summarised some results, dealing with the spectra of nebulae, recently published by Prof. Wolf. Some interesting comments on these results are now published by Dr. Eberhard in No. 4318 of the *Astronomische Nachrichten*.

First he directs attention to the enumeration of the nebular lines adopted by Prof. Wolf; this is not in accordance with the conventionally accepted enumeration, and seems likely to lead to confusion. Prof. Wolf found that the central star of the Ring nebula in Lyra is apparently less active, actinically, than the ring itself; Dr. Eberhard points out that this is a matter of the relative aperture of the instrument used, and the result was to be expected from the instrument employed by Prof. Wolf. He also reminds us that the unknown line at λ 345, suspected by Prof. Wolf in the spectrum of N.G.C. 2023, was certainly observed by Palmer in Nova Persei and in N.G.C. 6886.

According to Prof. Wolf's observations, H γ was found to be double in N.G.C. 6210, but Dr. Eberhard suspects that, as the dispersion employed was small, this was not an actual doubling, but the incidence of two separate lines, λ 4341 and λ 4363; he also questions some of the identifications given.

THE ORBITS OF SPECTROSCOPIC BINARIES.—In recent numbers of the Publications of the Allegheny Observatory the orbits of several spectroscopic binaries are discussed. In No. 10 (vol. i.) Mr. R. H. Baker discusses the orbit of the spectroscopic components of α Virginis, and derives final elements, which give the period as 4.01416 days, the eccentricity as 0.10, and the apparent semi-major axis as 6,930,000 km.

In No. 11 the same observer discusses the results obtained for the spectroscopic components of u Herculis, whilst in No. 12 the orbit of α Coronæ Borealis is derived, by Mr. F. C. Jordan, from measures of 136 plates taken during 1907 and 1908 with the Mellon single-prism spectrograph attached to the 30-inch reflector. The final elements give the period as 17.36 days, the eccentricity as 0.387, and the apparent semi-major axis as 7,671,000 km.

THE CIRCULARITY OF PLANETARY ORBITS.—From Prof. T. J. J. See we have received an abstract from the *Astronomische Nachrichten* in which he discusses the origin of the planetary system and the reason for the circularity of the orbits of the planets and satellites. Rejecting Laplace's hypothesis of a central rotating nucleus, casting off successive portions which became

planets, Prof. See suggests that the planets are bodies which came from outside into such a nebulous mass as Laplace's original "solar nebula." The circularity of the orbits then becomes the natural consequence of the revolution of such bodies, around the central nucleus, through the resisting medium of the nebulous matter.

THE NATURAL HISTORY MUSEUM.

THE subjoined letter appeared in the *Times* of Monday, April 19.

It will be generally admitted that the Natural History Museum is one of the greatest scientific institutions in this country. It receives a grant of more than 60,000l. a year of public money, and is the national centre for the cultivation and organisation of the natural-history sciences. It is therefore a matter of concern, not only to naturalists, but to the public generally, that this great national institution should be administered in the best possible way. Unfortunately, in the opinion of all independent naturalists now living and of all the leading naturalists of the last forty-five years, the system of administration of the natural history departments of the British Museum is so defective that the accomplishment of the great objects for which the museum exists is seriously hampered. Rumours of this have already reached the public ear. It is not, however, our design, for the present, to refer to these rumours beyond stating that there is a strong *a priori* probability of their truth, for they indicate a state of affairs which could hardly be avoided under the present system of administration. The defects in this system to which we now desire to direct attention are as follows:—

(1) The government of the Natural History Museum is nominally, and in the eyes of the public, in the hands of the trustees of the British Museum, a large body of distinguished men, forty-nine in number, of high rank and great importance in the State. This number is so large that the trustees cannot act effectively as a single body. The result is that the executive is restricted to a small section of them, known as the standing committee, an entirely irresponsible body, subject to no control or criticism except of a purely formal kind, though spending annually large sums of public money.

(2) While the actual government of the museum is in the hands of the standing committee, the appointment of all officers and servants is in the hands of the principal trustees—the Archbishop of Canterbury, the Lord Chancellor, and the Speaker of the House of Commons. This arrangement, by which the control after appointment is in different hands from those which make the appointment, is highly unsatisfactory. For, should the principal trustees appoint a director not acceptable to the other trustees, as has happened, it is clear that a very difficult position must necessarily be created, alike for trustees and director. Moreover, it is, in our opinion, inimical to the proper conduct of the museum that the appointment to the subordinate offices should be made by the principal trustees. This point has already been touched upon in the fourth report of the Royal Commission of 1874. The commissioners state that:—

"It is held to be singularly inappropriate that the three important personages who are the principal Trustees, occupied as they are in the discharge of the highest functions in Church and State, should be burdened with the duty of making appointments to offices of every grade in the British Museum."

(3) The standing committee of the trustees control, not only the Natural History Museum at South Kensington, but also the Library and the Museum of Art and Archaeology at Bloomsbury. This arrangement cannot be regarded as satisfactory, because with the rapid growth of archaeology and natural science in the last fifty years the interests represented by the two museums have become so vast, complex, and divergent that it is beyond the power of a single body of men, even of the knowledge of affairs and distinction of the trustees, to fully understand the interests involved. The subdivision of the subjects was recognised when the natural science part of the museum was removed to South Kensington, and it is obvious that two institutions situated so far apart, and dealing with